



## **AIR MONITORING / SAMPLING WORK PLAN**

### **Prepared For:**

**Wood River Pipe Lines, LLC**

**Gasoline/Diesel Pipeline Release**

**Kankakee, Illinois**

#### **DISCLAIMER:**

SOME FORMATTING CHANGES MAY HAVE OCCURRED WHEN  
THE ORIGINAL DOCUMENT WAS PRINTED TO PDF; HOWEVER,  
THE ORIGINAL CONTENT REMAINS UNCHANGED.

**MARCH 14, 2014**

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## 1.0 INTRODUCTION AND OBJECTIVES

At the request of Wood River Pipe Lines, LLC (Wood River), Conestoga Rovers & Associates (CRA) will provide air monitoring and industrial hygiene support in potentially impacted areas along a section of pipeline located near Kankakee, Illinois. These services are provided to evaluate potential health concerns pertaining to a petroleum pipeline release that was reported on March 14, 2014. The contents of the pipeline were reported to be, “gasoline, diesel, and/or gasoline/diesel mixture”.

The purpose of this work plan is to address air monitoring / sampling during the response and mitigation phases of the project. The specific objectives include the following:

- Perform real-time air monitoring for volatile organic compounds (VOC) at the perimeter of the work site to characterize potential exposures to members of the community.
- Perform real-time air monitoring for VOCs in the breathing zones of workers to evaluate potential exposures during on-site activities.
- Collect personal air samples, i.e. worker breathing zone samples, for benzene, toluene, ethyl benzene, xylene (BTEX) and total hydrocarbons during on-site operations.
- Comply with the air monitoring requirements of the applicable Occupational Safety and Health Administration (OSHA) Benzene Standards.
- Establish and implement procedures to ensure appropriate responses to elevated levels of gasoline/diesel compounds. This may include identifying areas requiring respiratory protection, or arranging for a timely evacuation of the work site in the event that hazardous concentrations of airborne BTEX vapors are detected.
- Communicate the hazards associated with exposures to gasoline/diesel constituents to the affected workers, members of the neighboring community, and other potential receptors.
- Provide recommendations for controlling site exposures, respiratory protection and other personal protective equipment (PPE) to incident command.

CRA will continue monitoring until the clean up phase of the project is completed and worker / community exposures to gasoline/diesel are eliminated. The air monitoring data will be collected and compiled in accordance with established guidelines. In addition, the results will be communicated to Wood River, site workers, and others as required and/or as necessary to ensure the safety and health of potentially affected individuals.

## 2.0 EXPOSURE STANDARDS AND GUIDELINES

CRA will rely on the standards and guidelines established in the United States for affected workers and community members. The air monitoring / sampling results, collected at the Site, will be compared to the applicable occupational exposure limits (OEL), Minimal Risk Levels (MRL), and other applicable guidelines, such as the United States Environmental Protection Agency's (USEPA) Regional Screening Levels (RSLs) for residential receptors. CRA will also consider the parameters of the facility's air permitting requirements as part of the preparation for this assessment.

### Occupational Exposure Limits

Federal OSHA promulgates workplace standards to protect the safety and health of workers. OSHA requires the employer to reduce airborne exposures below the established permissible exposure limits (PEL). Additionally, the American Conference of Governmental Industrial Hygienists (ACGIH) has established threshold limit values (TLV) to protect workers from hazards on the job. The established TLVs shall be considered guidelines in the control of health hazards. Similarly, the National Institute for Occupational Safety and Health (NIOSH) has established guidelines to protect workers from chemical hazards on the job. Table 1 summarizes the OSHA permissible exposure limits (PEL), ACGIH threshold limit values (TLV), and NIOSH Immediately Dangerous to Life and Health (IDLH) guidelines for the recognized chemicals of interest (COI) identified at the response site.

**Table 1**  
**Occupational Exposure Limits and Guidelines**

<i>Analyte</i>	<i>OSHA PEL</i>		<i>ACGIH-TLV</i>		<i>NIOSH- IDLH <sup>5</sup></i>	<i>Units</i>
	TWA <sup>1</sup>	STEL <sup>2</sup>	TWA <sup>3</sup>	STEL <sup>4</sup>		
Benzene	1	5	0.5	2.5	500	ppm
Tolulene	200	300 C <sup>6</sup>	20	---	500	
Ethyl Benzene	100	125	100	125	800	
Xylene	100	150	100	150	900	

1. Permissible Exposure Limit - Time Weighted Average (PEL-TWA) = An 8-hour time weighted average. An exposure to any material listed in 29 CFR 1910.1000, Tables Z1 and Z2, in any 8-hour work shift of a 40-hour workweek shall not exceed the 8-hour time weighted average limit given for that material in the table.

2. Permissible Exposure Limit - Short Term Exposure Limit (PEL-STEL) = A 15 minute TWA exposure that should not be exceeded at any time during a workday.
3. Threshold Limit Value - Time Weighted Average (TLV-TWA) = The TWA concentration for a conventional 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect (ACGIH, 2014).
4. Threshold Limit Value - Short Term Exposure Limit (TLV-STEL) = A 15 minute TWA exposure that should not be exceeded at any time during a workday, even if the 8-hour TWA is within the TLV-TWA. (ACGIH, 2014)
5. Immediately Dangerous to Life and Health (IDLH) = Indicates an exposure to airborne contaminants that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment.
6. Acceptable Ceiling = An exposure to a substance listed in OSHA Table Z-2 shall not exceed at any time during an 8-hour shift the acceptable ceiling concentration given for the substance in the table, except for a time period and up to a concentration not exceeding the maximum duration and concentration allowed in the column under "acceptable maximum peak" above the acceptable ceiling concentration for an 8-hour shift

### Community Risk Levels

The Agency for Toxic Substances & Disease Registry (ATSDR) has developed Minimal Risk Levels (MRLs) to serve as a screening tool for public health professionals to evaluate potential exposure to hazardous substances. MRLs are estimates of the daily exposure to a hazardous substance that is likely to be without appreciable risk of adverse non-cancer health effects over a specified duration of exposure. MRLs are derived for acute (1-14 days), intermediate (>14-364 days), and chronic (≥365 days) exposure durations. ATSDR uses the no observed adverse effect level/uncertainty factor (NOAEL/UF) approach to derive MRLs. They are set below levels that, based on current information, might cause adverse health effects in the people most sensitive to such substance-induced effects. Exposure to a level above the MRL does not mean that adverse health effects will occur. Due to the potential acute health effects associated with exposures, analytical results will be compared to the applicable MRL. These values for the identified COI with established MRLs for inhalation exposures are summarized in Table 2.

**Table 2**  
**ATSDR Minimal Risk Levels (Inhalation)**

<i>Compound of Interest</i>	<i>Acute</i>	<i>Intermediate</i>	<i>Chronic</i>	<i>Units</i>
Benzene	0.009	0.006	0.003	ppm
Toluene	1	---	0.08	
Ethylbenzene	5	2	0.06	
Xylene	2	0.6	0.05	

The MRL-based screening of air data is a screening-level evaluation known as Tier 1. Further evaluations comparing air monitoring data to site-specific and duration-specific exposure values is known as Tier 2. USEPA's Acute Exposure Guideline Levels (AEGLs) will be used as guidance to prevent unnecessary exposure to residents under the Tier 2 approach. The AEGL-1 values for the COI are listed in Table 3. The AEGL-1 values are defined as:

"The airborne concentration (expressed as ppm [parts per million] or mg/m<sup>3</sup> [milligrams per cubic meter]) of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure."

**Table 3**  
**USEPA Acute Exposure Guideline Levels (Inhalation)**

<i>Compound of Interest</i>		<i>Exposure Duration</i>				
		<i>10 min</i>	<i>30 min</i>	<i>60 min</i>	<i>4 hr</i>	<i>8 hr</i>
Benzene	AEGL-1	130	73	52	18	9
Toluene	AEGL-1	200	200	200	200	200
Ethylbenzene	AEGL-1	33	33	33	33	33
Xylene	AEGL-1	130	130	130	130	130

Based on these levels, site-specific action levels for the community are summarized in Table 3. Benzene is the COI primarily considered for the site-specific action levels due to the fact it possesses the lowest guideline. Based on evaluations to-date, the ratio of benzene air concentrations to total VOC air concentrations is approximately 1:100. Thus, a reading of 10 ppm VOC indicates the presence of approximately 0.1 ppm benzene. The action levels for benzene will be guided by the real-time air concentration of total VOCs using this relationship.

#### Response Action Levels

Action levels have been established to facilitate a timely and appropriate response to the detection of airborne hazards associated with COI. Action levels have been set at levels lower than the established exposure limits and guidelines. The purpose is to ensure that if these levels are detected, they are effectively communicated to affected workers and off-site

receptors so that appropriate action can be taken. The action levels were established based on the information provided for the Site. These action levels may be modified as additional information on the Site conditions becomes available. The site-specific action levels for the work site are listed in Table 4.

**Table 4**  
**Real Time Air Monitoring Site Action Levels**

<i>Analyte</i>	<i>Action Level <sup>1</sup></i>	<i>Description of Action</i>
Benzene	<0.25 ppm	No action required.
	≥0.25 ppm	Confirm with a duplicate sample. Benzene levels will be communicated to designated site officials and workers will be notified to move away from the area
Toluene	< 50 ppm	No action required.
	50-100 ppm	Confirm with a duplicate sample. Toluene levels will be communicated to designated site officials.
	> 100ppm	Confirm with a duplicate sample. Workers will be notified and moved away from areas of elevated concentrations.
Xylene	< 50 ppm	No action required.
	50-100 ppm	Confirm with a duplicate sample. Xylene levels will be communicated to designated site officials.
	>100 ppm	Confirm with a duplicate sample. Workers will be notified and moved away from areas of elevated concentrations.
VOCs	< 25 ppm	No action required.
	25-50 ppm	VOC levels will be communicated to designated site representatives. Confirm benzene levels using chemical-specific detection method.
	> 50 ppm	Confirm with duplicate sample. Workers will be notified and moved away from areas of elevated concentrations.

1. Action Levels are based on sustained (>1 min) airborne concentrations.

### **3.0 REAL-TIME MONITORING**

Real-time air monitoring for VOCs will be performed during normal work operations using RAE Systems MultiRAE Plus Photoionization Detectors (PID) AreaRAE PIDs, and UltraRAE PIDs, with benzene-specific detection tubes. The MultiRAE and AreaRAE instrument detection

limit for VOCs is 0.1 ppm and the UltraRAE instrument detection limit for benzene is 0.1 ppm. In addition, Gastec colormetric detection tubes will be used to monitoring for specific COI (i.e. BTEX). All instruments will be calibrated and operated in accordance with the manufacturer's specifications or applicable test/method specifications. Real time air monitoring will be performed at the following locations:

- Impacted areas where workers are present
- Site perimeter – upwind and downwind
- Off-site receptors (as identified and appropriate)

AreaRAE PIDs will be placed at the perimeter of the work site and programmed to continuously monitor VOC concentrations. Using radio telemetry, the instantaneous readings for each AreaRAE will be transmitted to a single host computer at the site, allowing CRA personnel to simultaneously monitor the airborne concentrations for all perimeter stations from a central location. MultiRAE and UltraRAE PIDs as well as Gastec detector tubes will be used to monitor the airborne concentrations of VOCs and BTEX in the immediate work area and at designated off-site locations.

If airborne concentrations of the chemicals listed in Table 4 are detected above the action levels established for the site, designated site safety personnel, operations officials, affected workers, and/or local regulatory representatives will be notified and appropriate actions will be taken to ensure the health and safety of the site workers.

#### **4.0     INTEGRATED AIR SAMPLING**

Personal air samples will be collected from the breathing zones of on-site workers in order to evaluate potential exposures to constituents of gasoline/diesel. These air samples will be analyzed for BTEX and total hydrocarbons.

A similar exposure group (SEG) analysis will be conducted to determine the number of samples which should be collected to represent the various job tasks conducted during the clean up efforts. SEGs are groups of workers having the same general exposure profile because of the similarities and frequency of the tasks they perform, the materials/processes in which they work, and the similarity of the way they perform the tasks. CRA personnel will identify and continuously observe work activities with potential gasoline/diesel exposures to determine SEGs. The major processes and work operations will be defined and correlated with the potential exposure to gasoline/diesel based on proximity to impacted areas. The number and



frequency of personal air samples will be determined by the CRA CIH based on the representative exposures of the on-Site workers.

Area air samples for BTEX will be collected along the perimeter of the Site for comparison to the applicable community risk based standards for the Site COI. The area sample stations will be co-located with the real-time air monitoring instruments. These samples will be collected in order to determine representative airborne exposures during response and mitigation activities. The frequency and duration of the area air sampling will be determined by a CRA CIH, based on the recognized risk to off-Site receptors.

All samples will be collected and analyzed in accordance with established methods. The analytical air sampling methods for constituents of gasoline/diesel are summarized in Table 5, and copies of these methods are included as attachments.

**Table 5**  
**Summary of Analytical Air Sampling Methods**

<i>Analytical Method</i>	<i>Sample Media</i>	<i>Flow Rate (mL/min)</i>	<i>Typical Sample Volume</i>
NIOSH 1500/1501	100mg / 50 mg charcoal tube, w/ air sampling pump	200	96L
	3M 3520 OVM Passive Dosimeter	N/A	N/A
EPA TO15+TICs	1 Liter Mini-Can	---	1L

All samples will be shipped daily to Galson Laboratories, an American Industrial Hygiene Association (AIHA) accredited laboratory. Media will be provided to the laboratory for field blank sample comparison. All samples will be shipped using appropriate Chain of Custody (COC) procedures.

## **5.0 QUALITY ASSURANCE / QUALITY CONTROL (QA/QC) AND REPORTING**

All real-time air monitoring / integrated air sampling data and supporting documentation collected during this project will be stored in a comprehensive on-site electronic database. CRA will utilize a custom database application that will upload data directly to a secure CRA server, which will be backed up daily. CRA and approved users will have unlimited access to view current and historical photographs, sampling / survey information, reports, and other supporting documentation collected in real-time through a secure CRA website. CRA will utilize mobile data collection and data management tools for field data collection, archiving, and reporting.

CRA utilizes industry-leading mobile data collection and data management tools for field data collection, archiving, and reporting. Hardware such as iPads and ruggedized mobile devices will be used during the survey in order to increase the accuracy of the data collected and decrease the reporting time.

All manually-collected real-time data and integrated sampling information will be reviewed to ensure accuracy and completeness. The manually-collected monitoring / sampling data will be uploaded into an electronic database and will undergo a daily QA/QC review. All data entry forms and field notes will be kept on-site and retained for reference upon completion of the project. Any errors identified during the QA/QC process in field notes or data will be noted appropriately, while retaining original information to ensure a proper historical record. If necessary, full laboratory analysis data packages will be provided, and associated data validation processes will be arranged.

During the project, interim reporting of results may be required. This may include data summaries, maps, or other presentations of preliminary monitoring and sampling results. Such reporting will be considered preliminary, as a final QA/QC of the data will not be complete. At the completion of the project, a report will be prepared in which all data collected through real-time monitoring and integrated sampling analyses will be compiled, summarized, and reported to Wood River. All data contained in the final report will have been through the QA/QC process, will be reviewed by a CRA CIH, and will be considered final. On site workers will also be notified of sampling results in accordance with applicable OSHA regulations.

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